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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,856	04/28/2006	Masayuki Sanbayashi	Q78302	3791

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EXAMINER

BERNS, DANIEL J

ART UNIT	PAPER NUMBER
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4162

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/577,856	Applicant(s) SANBAYASHI ET AL.	
	Examiner DANIEL BERNS, ESQ.	Art Unit 4162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☒ Claim(s) 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/28/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The disclosure is objected to because of the following informalities: paragraph 0044 of applicant's Pre-grant Publication, No. US2007/0084381 (published Apr. 19, 2007) contains the phrase "[o]f these, aluminum triisopropoxide and aluminum trimethoxide are particularly preferred." No prior mention of aluminum triisopropoxide appears therein, only a mention of aluminum tripropoxide. Accordingly, aluminum triisopropoxide cannot be a preferred member of a group of compounds when it does not appear therein.

Appropriate correction is required.

Claim Objections

3. Claim 13 is objected to because of the following informalities: the claim is an incomplete sentence, as no period appears at the end thereof. Examiner is thus without knowledge as to whether or not claim 13 continues after the phrase "0.1 mass % as reduced to TiO₂[.]" For examination purposes, this claim has been treated as if a period appears immediately following the quoted passage. Should a different interpretation thereof be desired, applicant is directed to explicitly so state in responding to this Office Action.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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5. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Said claim appears to be in Markush-type formatting, but uses claim language incompatible with accepted Markush language. Applicant is advised to utilize proper alternative language. Applicant should note that for examination purposes, Examiner has interpreted said claim to read "... at least one species selected from the group consisting of titanium dioxide particles and titanium dioxide particles comprising phosphorus-containing compound on their surfaces."

6. Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 21 contains the wording "...produced through *a method* as recited in claim 17[.]" (emphasis supplied) however no method appears in claim 17 – only a composition and attributes thereof. Claim 18 is a method claim, and as such claim 21 has been treated as depending therefrom for examination purposes. Appropriate correction is required. Should an interpretation other than the Examiner's be desired, applicant is directed to explicitly so state in responding to this Office Action.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-4, 6-15, 17 and 22 are rejected under 35 U.S.C. 102(a) and (e) as being anticipated by Tanaka et al., US2003/0181329 (provided within applicant's Information Disclosure Statement ("IDS")) ("Tanaka"). Tanaka discloses a composition for forming a transparent film comprising photocatalytic titanium dioxide particles of the brookite phase (optionally coated with a phosphorous-containing compound), *see id.* at par. 0052, 0131 and 0137-38, a cohydrolysis-polycondensation product of an aluminum alkoxide and a titanium alkoxide, zirconium ammonium carbonate ("ZAC"), *see id.* at par. 0198, and water, *see id.* at par. 0141. Tanaka further provides that the photocatalytic composition should preferably be at pH 5-9, *see id.* at par. 0145, 0185, and 0201, with specifically-disclosed values such as 8.2. *See id.* at par. 0242. Said composition may thus reasonably be expected to possess and satisfy the properties and functionality limitations of claims 8-15 and 17, as said claims merely state properties of claim 1's composition. As such, these claims are *prima facie* anticipated by Tanaka. *See In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430,433 (CCPA 1977); MPEP 2112.01. Tanaka additionally discloses component weight percentages of 0.1-10 wt. % (the photocatalytic particles, *see id.* at par. 0135; specifically-disclosed value of 1.5 wt. % at par. 0242) and 0.01-20 wt. % (ZAC, *see id.* at par. 0198 and 0200), and curing said composition at temperatures of no more than 200 deg. C to form a transparent photocatalytic film, *see id.* at par. 0098, 0202, 0207-08, and claim 64. Claims 1-4, 6-15, 17 and 22 are thus rejected under 35 U.S.C. 102(a) and (e) as anticipated by Tanaka.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claim 4 is alternatively rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka, par. 0198 and 0200. While Tanaka discloses a broader range of ZAC wt. percentages than those claimed, said claimed ranges lie within Tanaka's ZAC ranges and are thus *prima facie* obvious in view thereof. *See, e.g., In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976) (holding that a *prima facie* case of obviousness exists where claimed ranges “overlap or lie inside ranges disclosed by the prior art”); MPEP 2144.05. Claim 4 is thus rejected under 35 U.S.C. 103(a) as obvious over Tanaka in view of longstanding legal precedent.

12. Claims 1-3, 5-17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanbayashi et al., EP 1153999 (provided within applicant's IDS) (“Sanbayashi”) in view of Koichi et al., JP 62-036045 (provided within applicant's IDS) (“Koichi”) (English abstract).

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Whereas Sanbayashi discloses a composition for forming a transparent film comprising 1-25 wt. % photocatalytic brookite-type titanium oxide particles of 0.004-0.1 μ m avg. diameter, ZAC and water at a pH of 9, *see* Sanbayashi at abstract, par. 0012-0015, 0019 and 0048, optionally including a surface active agent therewith to enhance the composition's film-forming capabilities, *see id.* at par. 0030, coating and heat-curing said coating composition upon a substrate at 80-500 deg. C, *see id.* at par. 0032-33, Sanbayashi does not disclose the presence within said composition of aluminum and titanium alkoxides. Such limitations are taught by Koichi, however, who employs an aqueous solution of such alkoxides for a hydrolysis-condensation reaction to form a film for coating upon a glass surface. *See* Koichi at English abstract. Given that Koichi's alkoxides are directly utilized in forming films upon glass (i.e.: transparent) surfaces, it would have been obvious to one of ordinary skill in the art at the time of the invention to employ such alkoxides with Sanbayashi's additional materials and methodology to form, coat, and cure transparent films. Further, the expected product of such a combination of art references would as above be reasonably expected to possess and satisfy the properties and functionality limitations of claims 8-15 and 17, as said claims merely state properties of claim 1's composition. As such, these claims are *prima facie* obvious over Sanbayashi in view of Koichi. *See In re Best*; MPEP 2112.01. Sanbayashi's temperature range for curing the coated composition and its overall weight percentage range for the composition's photocatalytic particles, substantially overlapping those respectively within claims 2 and 3, render said claims *prima facie* obvious. *See, e.g., In re Wertheim*; MPEP § 2144.05. Claims 1-3, 5-17 and 22 are thus rejected under 35 U.S.C. 103(a) as obvious over Sanbayashi in view of Koichi.

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13. Claims 1-3 and 5-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanbayashi in view of Taneda et al., Pat. No. 5,248,637 (1993) ("Taneda"). Whereas Sanbayashi does not disclose the formation of a transparent film-forming composition as that in claim 1 by combining various concentrations of aluminum and titanium alkoxides, an acid, a beta-diketone, photocatalytic particles, and a hydrophilic solvent in water within a given temperature range, these limitations are taught by Taneda. Taneda details the formation of glassy (i.e.: transparent) material by combining aluminum isopropoxide (0.010 mol), titanium butoxide (0.005 mol), the beta-diketone acetylacetone (0.025 mol), formic acid (0.182 mol), nitric acid (catalytic amt.), methanol (approx. 8.7 total wt. % of mixture), and water (3.111 mol) at 80 deg. C. *See* Taneda at col. 3, ln. 45-55. Taneda additionally lists a plurality of other absolute and relative component concentrations used in producing its glassy product material. *See id.* at col. 4-6. The fact that formic acid and water are present in Taneda in proportional amounts greater than those provided within claim 18 does not render said claim non-obvious - it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *See, e.g., In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Given that Taneda's materials and methodology are directed toward producing glassy (i.e.: transparent) materials, similar to those to which Sanbayashi's disclosure is also directed, it would have been obvious to one of ordinary skill in the art at the time of the invention to employ Taneda's materials, temperature and concentration values, and strategy with Sanbayashi's aqueous ZAC and photocatalytic particles at pH 7-9 to produce a transparent film-forming composition. Thus, claims 1-3, 5-20, and 22 are rejected under 35 U.S.C. 103(a) as obvious over Sanbayashi in view of Taneda.

Claim 21, examined as depending from claim 18 as explained in the 35 U.S.C. 112 claim rejections section, is thus rejected as well under 35 U.S.C. 103(a) as obvious over Sanbayashi in view of Taneda for the reasons stated directly above.

14. Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanbayashi in view of Koichi, further in view of Hayakawa et al., EP 0816466 (provided within applicant's IDS) ("Hayakawa"). While Sanbayashi and Koichi collectively do not disclose various materials coated with their coating composition, such coated materials are taught by Hayakawa.

Hayakawa details such photocatalytically-coated substrates as a windowpane for various vehicles and buildings (such as control towers), a showcase window, advertisement billboard towers, etc.

See Hayakawa at pg. 5, ln. 18-25 and 40-45. Further, Hayakawa teaches that coating such substrates with photocatalyst imparts various beneficial properties thereto, such as improved visibility and/or self-cleaning abilities during rainy conditions. *See id.* at pg. 5, ln. 26-39. Given Hayakawa's recitation of the beneficial effects of coating various edificial and vitreous substrates with photocatalyst, it would have been obvious to one of ordinary skill in the art at the time of the invention to coat Sanbayashi and Koichi's photocatalyst composition upon substrates such as those detailed in Hayakawa. As such, claims 23-24 are rejected under 35 U.S.C. 103(a) as obvious over Sanbayashi in view of Koichi and Hayakawa.

15. Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanbayashi in view of Taneda, further in view of Hayakawa et al., EP 0816466 (provided within applicant's IDS) ("Hayakawa"). While Sanbayashi and Taneda collectively do not disclose various materials coated with their coating composition, such coated materials are taught by Hayakawa as detailed directly above in the preceding paragraph. Given Hayakawa's recitation of the

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beneficial effects of coating various edificial and vitreous substrates with photocatalyst, it would have been obvious to one of ordinary skill in the art at the time of the invention to coat Sanbayashi and Taneda's photocatalyst composition upon substrates such as those detailed in Hayakawa. As such, claims 23-24 are rejected under 35 U.S.C. 103(a) as obvious over Sanbayashi in view of Taneda and Hayakawa.

16. The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Suzuki et al., Pat. No. 3,894,881 (1975) ("Suzuki"). Suzuki teaches that adding a surface active agent to a coating agent composition is effective in smoothing the surface of said coating agent(s). *See* Suzuki at col. 2, ln. 30-38. Suzuki's disclosure is directed toward coating compositions providing improved surface properties such as scratch resistance for mainly plastic substrates, including transparent substrates, *see id.* at col. 2, ln. 67 to col. 3, ln. 25, directly analogous to the field of applicant's disclosure. However, Suzuki has not been relied upon in the foregoing rejections due to Sanbayashi's recitation of an optional surface active agent in its transparent film-forming composition as detailed above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL BERNES, ESQ. whose telephone number is (571)270-5839. The examiner can normally be reached on Monday thru Thursday, 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached at (571)272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DB/ August 1, 2008

/Jennifer McNeil/
Supervisory Patent Examiner, Art Unit 4162